WHAT IS CLAIMED IS:

1. An image processing apparatus converting a first image signal representing a level in density of each pixel with a predetermined number of tones, successively into a second image signal with a number of tones smaller than said predetermined number of tones, comprising:

a determiner successively receiving said first image signal for each pixel and determining a range for a level in density of each pixel;

an outputter comparing the level in density of each pixel with a threshold value corresponding to said range determined, for conversion into said second image signal for output; and

a corrector referring to a level in magnitude of said second image signal output from said outputter and the level in density of said first image signal to calculate a correction value correcting a level in density of a subsequent pixel for correction, said corrector changing a method of calculating said correction value when a range determined for said first image signal for a successively input pixel differs from a range determined for said first image signal for an immediately previously input pixel.

2. The image processing apparatus of claim 1, wherein said corrector includes:

an error calculator calculating an error between said first image signal and said second image signal; and

a correction value calculator calculating said correction value based on the error calculated by said error calculator.

3. The image processing apparatus of claim 1, wherein said corrector inverts a sign of said correction value when the range determined for said first image signal for a successively input pixel differs from a range determined for said first image signal for an immediately previously input pixel.

4. The image processing apparatus of claim 3, wherein said

corrector inverts the sign of said correction value when said first image signal has a level in density varying across said threshold value.

5. An image processing apparatus converting a first image signal representing a level in density of each pixel with a predetermined number of tones, successively into a second image signal with a number of tones smaller than said predetermined number of tones, comprising:

a determiner successively receiving said first image signal for each pixel and determining a range for a level in density of each pixel;

an inverter inverting a level in density of an input signal when said input signal has the level in density falling within a particular range;

a normalizer normalizing the level in density of said input signal to allow the level in density of said input signal to fall within a predetermined range;

a comparator comparing the level in density normalized with a predetermined threshold value to output a result by comparison;

an outputter referring to a result obtained from said determiner and a result obtained from said comparator to output said second image signal with said number of tones smaller than said predetermined number of tones; and

a corrector referring to the result obtained from said comparator and the level in density normalized, to correct a level in density normalized of a subsequent pixel.

6. An image processing apparatus converting an input signal representing a level in density of each pixel with a predetermined number of tones, into a signal with a number of tones smaller than said predetermined number of tones, comprising:

a first outputter comparing said input signal having a level in density falling within a first range with a first threshold value to output a signal of a first tone or a second tone;

a second outputter comparing said input signal having a level in density falling within a second range subsequent to said first range with a

second threshold value to output a signal of the second tone or a third tone; and

a controller controlling said first and second threshold values to be provided substantially in succession on a boundary of said first and second ranges.

7. The image processing apparatus of claim 6, wherein said controller controls said first and second threshold values to provide a small gap on the boundary of said first and second ranges between said first and second threshold values.

8. The image processing apparatus of claim 6, wherein said controller controls said first and second threshold values to be provided in succession on the boundary of said first and second ranges.

9. An image processing method converting a first image signal representing a level in density of each pixel with a predetermined number of tones, into a second image signal with a number of tones smaller than said predetermined number of tones, comprising:

a first step of inputting said first image signal for a pixel of interest and determining a range for a level in density of said pixel;

a second step of comparing the level in density of said pixel with a threshold value corresponding to the range determined, for conversion to said second image signal for output; and

a third step of referring to a level in magnitude of said second image signal output at said second step and the level in density of said first image signal to calculate a correction value correcting a level in density of a subsequent pixel, for correction, said third step changing a method of calculating said correction value when the range determined at said first step for said first image signal for an input pixel differs from a range determined for said first image signal for an immediately previously input pixel,

wherein said first to third steps are repeated for a pixel to be

successively processed.

10. An image processing apparatus converting a first image signal representing a level in density of each pixel with a predetermined number of tones, successively into a second image signal with a number of tones smaller than said predetermined number of tones, comprising:

a determiner successively receiving said first image signal for each pixel and determining a range for a level in density of each pixel;

an outputter comparing the level in density of each pixel with a threshold value corresponding to the range determined, for conversion into said second image signal for output; and

a corrector referring to a level in magnitude of said second image signal output from said outputter and the level in density of said first image signal to calculate a correction value correcting a threshold value to be used for processing a subsequent pixel for correction, said corrector changing a method of calculating said correction value when a range determined for said first image signal for a successively input pixel differs from a range determined for said first image signal for an immediately previously input pixel.

11. The image processing apparatus of claim 10, wherein said corrector includes:

an error calculator calculating an error between said first image signal and said second image signal; and

a correction value calculator calculating said correction value based on the error calculated by said error calculator.

12. The image processing apparatus of claim 10, wherein said corrector inverts a sign of said correction value when the range determined for said first image signal for a successively input pixel differs from a range determined for said first image signal for an immediately previously input pixel.

13. The image processing apparatus of claim 12, wherein said corrector inverts the sign of said correction value when said first image signal has a level in density varying across said threshold value.

14. An image processing apparatus converting a first image signal representing a level in density of each pixel with a predetermined number of tones, successively into a second image signal with a number of tones smaller than said predetermined number of tones, comprising:

a determiner successively receiving said first image signal for each pixel and determining a range for a level in density of each pixel;

an inverter inverting a level in density of an input signal when said input signal has the level in density falling within a particular range;

a normalizer normalizing the level in density of said input signal to allow the level in density of said input signal to fall within a predetermined range;

a comparator comparing the level in density normalized with a threshold value to output a result by comparison;

an outputter referring to a result obtained from said determiner and a result obtained from said comparator to output said second image signal with said number of tones smaller than said predetermined number of tones; and

a corrector referring to the result obtained from said comparator and said threshold value to correct a threshold value to be used for processing a subsequent pixel.

15. An image processing apparatus converting an input signal representing a level in density of each pixel with a predetermined number of tones, into a signal with a number of tones smaller than said predetermined number of tones, comprising:

an outputter outputting a value serving as a basis for a threshold calculation;

a threshold calculator using said basis for said threshold calculation to calculate at least two threshold values;

a thresholder referring to said at least two threshold values to threshold said input signal; and

a corrector referring to a result obtained from said thresholder and said value serving as said basis for said threshold calculation, to correct a value serving as a basis for a threshold calculation to be used for processing a subsequent pixel.

16. An image processing method converting a first image signal representing a level in density of each pixel with a predetermined number of tones, into a second image signal with a number of tones smaller than said predetermined number of tones, comprising:

a first step of inputting said first image signal for a pixel of interest and determining a range for a level in density of said pixel;

a second step of comparing the level in density of said pixel with a threshold value corresponding to the range determined, for conversion to said second image signal for output; and

a third step referring to a level in magnitude of said second image signal output at said second step and the level in density of said first image signal to calculate a correction value correcting a threshold value to be used for processing a subsequent pixel for correction, said third step changing a method of calculating said correction value when the range determined at said first step for said first image signal for an input pixel differs from a range determined for said first image signal for an immediately previously input pixel,

wherein said first to third steps are repeated for a pixel to be successively processed.